

REMARKS

Claims 1-7 are pending in this application. Claim 1 is an independent claim. Claims 2-7 are dependent claims.

Claims 1-7 have been rejected. Amendments to claims 1 and 4-7 are presented herein. Claim 3 has been cancelled in this response. No new matter is being presented, and approval and entry are respectfully requested.

Rejections Under 35 U.S.C. § 112, Second Paragraph

In numbered paragraph 2 on page 2 of the Office Action, the Examiner rejected claims 1-7 as being indefinite for the reasons set forth therein. Applicants submit that amendments to the claims presented above meet the requirements of 35 U.S.C. § 112, second paragraph. Accordingly, Applicants respectfully request withdrawal of the rejections to claims 1-7 under § 112, second paragraph.

Rejections Under 35 U.S.C. §§ 102 and 103

In numbered paragraph 4 on pages 2 and 3 of the Office Action, the Examiner rejected claims 1, 3, 5, and 7 under 35 U.S.C. § 102(b) as being anticipated by Yang (U.S. Patent No. 6,130,775).

In numbered paragraph 6 on pages 3 and 4 of the Office Action, the Examiner rejected dependent claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Yang in view of Mollenauer et al. (U.S. Patent No. 4,699,452).

In numbered paragraph 7 on page 4 of the Office Action, the Examiner rejected dependent claim 4 under 35 U.S.C. § 103(a) as being unpatentable over Yang in view of Kinoshita (U.S. Patent No. 6,342,965).

In numbered paragraph 8 on pages 4 and 5 of the Office Action, the Examiner rejected dependent claim 6 under 35 U.S.C. § 103(a) as being unpatentable over Yang in view of Thelen (U.S. Patent No. 4,373,782).

Applicants respectfully traverse these rejections for the reasons presented below.

Claim 1 recites, as amended, "a distributed amplifier unit having a first pumping light source for pumping only the upstream optical signal set to the first band, and a second pumping light source for pumping only the downstream optical signal set to the second band, wherein said first pumping light source amplifies the upstream optical signal set to the first band through backward pumping, and said second pumping light source amplifies the downstream optical signal set to the second band through backward pumping."

In the present invention, different bands are allocated for the upstream signal and the downstream signal, and individual pumping light sources are provided for each of the signals, traveling on the respectively allocated bands, to amplify only the signal on an allocated band. This is advantageous in that a lower noise level is produced.

The Yang reference relates to a bi-directional communication system in which pumping light is fed in both the forward direction to pre-amplify a signal, and the backward direction. However, Yang does not separate wavelengths of the bands allocated to upstream and downstream signals, or set pumping light wavelengths such that the pumping light is supplied to either an upstream or a downstream signal in the backward direction.

In contrast, the present invention sets pumping wavelengths to achieve signal amplification using only backward pumping. Thus, the present invention avoids problems related to forward pumping, such as degradation of transmission quality resulting from interference between the optical signal and the pumping light that travel in the same direction, and is able to achieve a better signal-to-noise ratio than the optical amplifier of the Yang reference.

Thus, it is submitted that claim 1 patentably distinguishes over the prior art.

As for the dependent claims, the dependent claims depend from the above-discussed independent claim 1 and are patentable over the prior art for at least the reasons discussed above.

Therefore, Applicants submit that claims 1, 2, and 4-7 patentably distinguish over the prior art. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections under §§ 102 and 103.

Conclusion

It is submitted that none of the references, either taken alone or in combination, teach the present claimed invention. Thus, claims 1, 2, and 4-7 are deemed to be in a condition suitable for allowance. Reconsideration of the claims and an early Notice of Allowance are earnestly solicited.

If there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

Finally, if there are any additional fees associated with filing of this response, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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